

Application No. 09/929,703

**REMARKS**

Favorable reconsideration and allowance of the subject application are respectfully requested. Claims 1-3, 5, 7, 10, 13-14, and 16-32 are pending in the present application, with claims 1, 13, and 16 being independent.

***Claim Rejections under 35 U.S.C. §103***

The Examiner rejected claims 1-3, 5, 16-19, 21, 22, 24, 25, 27-30, and 32 under 35 U.S.C. §103(a) as being unpatentable over Nikula et al (US 7031334) in view of Dent (US 5377183). Claims 7 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of J.P. Fonseka (IEEE ELECTRONICS LETTRS 2<sup>nd</sup> September 1999 Vol. 35 No. 18). Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al, and Dent, and further in view of Fujiwara (US 4794649). Claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Kim et al (US 6493333). Claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al, Dent, and Fujiwara, and further in view of Ricci et al (US 6463039). Claim 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Ricci et al. Claim 26 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Landolsi (US 6570842). These rejections are respectfully traversed insofar as they pertain to the presently pending claims.

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With respect to the rejection of claims 1-3, 5, 16-19, 21, 22, 24, 25, 27-30, and 32 under 35 U.S.C. §103(a) as being unpatentable over Nikula in view of Dent, Applicants respectfully traverse this rejection, for at least the following reasons, insofar as it pertains to the presently pending claims.

Applicants respectfully submit that the Examiner has failed to establish a *prima facie* case of obviousness and traverse the rejection.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

See MPEP §2143.

Applicants submit that the alleged combination of Nikula and Dent fails to teach or suggest all of the features recited in claim 1, and that the Examiner failed to identify all of the features recited in claim 1 in the applied references, and also failed to provide adequate motivation to support the obviousness rejection.

For example, independent claim 1 recites a method for transmitting a plurality of information symbols between a first transceiver and a second transceiver by modulating a carrier signal. Claim 1 recites that:

*a different modulation index is assigned to each one of the information symbols, the information symbols conveying data, and the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index,*  
*at least one characteristic physical variable of the carrier signal is modulated in accordance with the different modulation indices assigned respectively to the information symbols that are modulated onto the carrier signal to produce a modulated signal, and*

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*the modulated signal is transmitted from the first transceiver to the second transceiver, and the second transceiver evaluates the modulated signal to obtain the conveyed data.* (Emphasis added.)

Turning to the rejection in the outstanding Office Action, the Examiner stated that:

Nikula teaches a method for transmitting signals comprising assigning different modulation indices to different information blocks conveying data (Col. 2, Lines 32-47); modulating a signal using phase modulation (Col. 5, Lines 33-36); the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index, wherein at least one characteristic physical variable of the carrier signal is modulated in accordance with the different modulation indices assigned respectively to the information blocks that are modulated onto the carrier signal to produce a modulated signal (Col. 8, Lines 27-45); the modulated signal is transmitted from the first transceiver to the second transceiver, and the second transceiver evaluates the modulated signal to obtain the conveyed data (Col. 7, Lines 52-63; Col. 8, Lines 27-45); and transmitting the modulated signal from the transmitting device to a receiving device, wherein the receiving device evaluates the modulated signal to obtain the conveyed data (Col. 7, Lines 45-63; Col. 8, Lines 27-45).

(Emphasis added).

However, the Examiner stated that "Nikula is not explicit about the modulation technique is (sic) an amplitude modulation technique." The Examiner further alleged that:

"one of ordinary skill in the art would recognize that it is well known in the art to use an amplitude modulation technique instead of a phase modulation technique for modulating different symbols that convey different information (i.e., user information and signaling information) utilizing a type of amplitude modulation technique (such as QPSK or QAM), wherein QAM is the addition of amplitude modulation to multi-level PSK (phase shift keying) and has the advantage of encoding information into variations of amplitude and as the result it has the advantage of robustness to noise as it is evidenced by Dent (Col. 10, Lines 20-24 and 43-55)."

(Emphasis added).

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Therefore, the Examiner takes the position that "it would have been obvious to one of ordinary skill in the art to utilize a type of amplitude modulation technique such as QAM or QPSK to modulate different symbols conveying information as taught by Dent in order to take advantage of their robustness to noise."

Applicants respectfully submit that the alleged combination of Nikula and Dent fails to teach or suggest all of the features recited in claim 1, and that the Examiner failed to identify all of the features recited in claim 1 in the applied references, and also failed to provide adequate motivation to support the obviousness rejection.

First, Applicants respectfully note that the Examiner has not cited any support for the assertion that it would have been obvious "to modulate different symbols conveying information as taught by Dent in order to take advantage of their robustness to noise" (emphasis added). Applicants respectfully submit that this conclusory statement made by the Examiner is not a proper basis to substantiate an obviousness rejection.

Second, the Examiner asserted that Nikula is not "explicit about the modulation technique... ." Applicants respectfully disagree, and submit that Nikula clearly teaches methods and systems which use phase modulation. For example, Nikula teaches that the "modulation step is accompanied with a phase rotation which may *[sic]* an inherent consequence of the applied modulation algorithm or which may be introduced deliberately as an addition to the actual modulation." (see col. 5, lines 39-43; emphasis added).

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Specifically, Nikula teaches that transmitting device in a cellular radio network typically has a certain upper limit of allowed transmission power for each transmission burst. If the embodiment of FIG. 1 (allocation of complete bursts to fast signaling information) is used, it is possible to use a higher transmission power to transmit the bursts stolen to the use of fast signaling information than the regular bursts. This is due to the fact that the nonlinearity of a transmission power amplifier (especially in a base station) will become more evident if a multilevel phase modulation method is used than with a binary modulation method (Binary Phase Shift Keying), imposing a mandatory 2-4 dB back-off at the highest 8-PSK transmission power levels (see col. 6, lines 36-47).

Nikula further discloses the rotation shown in Fig. 1 is related to the modulation; in that an assembled transmission frame 401 in the form which it has in a transmitting device before modulation onto a carrier frequency. In the middle of the transmission burst there is a training sequence which consists of a string of known consecutive symbols. The schematic indication ABABAB . . . has been used for the known form of the training sequence. The modulation step is accompanied with a phase rotation which may be an inherent consequence of the applied modulation algorithm or which may be introduced deliberately as an addition to the actual modulation. An exemplary way of applying phase rotation is the following. According to the 8-PSK modulation principle there are eight allowed phase angle values for the modulated signal, e.g. 0,  $+\pi/4$ ,  $+\pi/2$ ,  $+\pi/4$ ,  $\pi$ ,  $-\pi/4$ ,  $-\pi/2$ ,  $-\pi/4$ . Each of them corresponds to a particular set of three consecutive bits in the data stream to be transmitted: for example the bit combination (0,1,0) corresponds to a phase angle value  $+\pi/2$ . A constant phase rotation by X radians may be specified so that each symbol generated according to the basic

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modulation principle will be additionally rotated by  $X$  radians in the phase space. For example defining  $X=+3\pi/8$ , the final phase modulated symbol that will represent the bit combination (0,1,0) in the transmitted signal will have the phase angle value  $+7\pi/8$  (c. 5, ll. 33-55).

Nikula further discloses taking advantage of the phase rotation characteristics associated with the different modulation methods by using the rotation of the constellation points in the phase space as an indication of the transmission burst contents. Each transmission burst contains a training sequence the symbol content of which is known, so a receiver can use the received form of the training sequence to find out a correct phase de-rotation angle. Associating a certain unique phase rotation angle to each modulation method is thus a feasible way of conveying a piece of simple modulation-related information (see col. 3, lines 2-12; emphasis added).

Thus, contrary the Examiner's stated position in the outstanding Office Action, Nikula clearly is explicit about the modulation technique. That is, Nikula clearly discloses associating a certain unique phase rotation angle to each modulation method.

Third, the relied upon portions of Dent do not disclose or suggest at least "*the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index,*" (emphasis added) as recited in claim 1, and thus, Dent does not make up for the deficiencies of Nikula.

Instead, Dent merely discloses at Col. 10, Lines 20-24 and 43-55, that the received signals are decoded to extract code information which is used by the mobile station to determine if the mobile station is being called and to determine the phase of

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the calling channel signal. See Dent at col. 10, lines 2-24; claim 1. Dent also discloses that the modulation is by quadrature phase shift keying (see Dent at claim 5), offset quadrature phase shift keying (see Dent at claim 6), quadrature amplitude modulation (see Dent at claim 7), and offset quadrature amplitude modulation (see Dent at claim 8). See Dent at col. 10, lines 43-55.

However, Dent does not disclose or suggest at least "*the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index*," (emphasis added) as recited in claim 1. Further, the Examiner failed to identify any teaching in Dent for the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index, as claimed.

Thus, the Examiner appears to be relying on Dent merely for the teaching of the existence of amplitude modulation. However, Applicants respectfully submit that the mere disclosure of amplitude modulation does not make up for the deficiencies of Nikula, or for that matter, support that alleged motivation to one of ordinary skill in the art to modify Nikula to arrive at the claimed invention.

Fourth, Applicants note that, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). See M.P.E.P. § 2143.01.

As set forth above, Nikula explicitly discloses associating a certain unique phase rotation angle to each modulation method. Nikula was specifically designed to operate

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by associating a certain unique phase rotation angle to each modulation method, not based on amplitude modulation. Accordingly, the stated combination of Nikula and Dent would require a substantial reconstruction and redesign of the elements shown in Nikula as well as a change in the basic principle under which Nikula's construction was designed to operate. Accordingly, Applicants respectfully submit that the alleged combination of Nikula and Dent is not sufficient to render the claims *prima facie* obvious.

Moreover, Applicants respectfully submit that a statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention). See M.P.E.P. § 2143.01. Accordingly, Applicants respectfully submit that the alleged combination of Nikula and Dent is not sufficient to render the claims *prima facie* obvious.

For at least the foregoing reasons, the alleged combination of Nikula and Dent fails to teach at least, "a different modulation index is assigned to each one of the



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information symbols, the information symbols conveying data, and the modulation indices identifying a type of the conveyed data based on an amplitude of the amplitude modulation index," as recited in claim 1 (emphasis added); and "wherein said modulation indices respectively assigned to said information symbols identify said information items based on an amplitude of each of said modulation indices," as recited in claim 16 (emphasis added).

Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw the rejection. Independent claim 16 recites, in this respect, related subject matter to claim 1, and is at least allowable for similar reasons provided above in the arguments for the allowability of claim 1.

Claims 7 and 20 are rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of J.P. Fonseka (IEEE ELECTRONICS LETTERS 2<sup>nd</sup> September 1999 Vol. 35 No. 18). This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

Dependent claims 7 and 20 should be considered allowable at least for depending from an allowable base claim. Applicants submit that the reference cited above in support of the rejection of the dependent claims, as applied, fails to cure the deficiencies of Nikula and Dent as applied in the independent claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

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Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al, and Dent, and further in view of Fujiwara (US 4794649). This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

Dependent claim 10 should be considered allowable at least for depending from an allowable base claim. Applicants submit that the reference cited above in support of the rejection of the dependent claim, as applied, fails to cure the deficiencies of Nikula and Dent as applied in the independent claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Independent claim 13 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Kim et al (US 6493333). This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

Independent claim 13 recites, in this respect, related subject matter to claim 1, and is at least allowable for similar reasons provided above in the arguments for the allowability of claim 1. Applicants further submit that Kim, as applied by the Examiner, fails to cure the deficiencies of Nikula and Dent, as set forth above with respect to claim 1. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al, Dent, and Fujiwara, and further in view of Ricci et al (US 6463039). This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

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Dependent claim 14 should be considered allowable at least for depending from an allowable base claim. Applicants submit that the references cited above in support of the rejection of the dependent claim, as applied, fail to cure the deficiencies of Nikula and Dent as applied in the independent claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Claim 31 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Ricci et al. This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

Dependent claim 31 should be considered allowable at least for depending from an allowable base claim. Applicants submit that the reference cited above in support of the rejection of the dependent claim, as applied, fails to cure the deficiencies of Nikula and Dent as applied in the independent claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

Claim 26 is rejected under 35 U.S.C. §103(a) as being unpatentable over Nikula et al and Dent, and further in view of Landolsi (US 6570842). This rejection is respectfully traversed insofar as it pertains to the presently pending claims.

Dependent claim 26 should be considered allowable at least for depending from an allowable base claim. Applicants submit that the reference cited above in support of the rejection of the dependent claim, as applied, fails to cure the deficiencies of Nikula and Dent as applied in the independent claims. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this rejection.

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**CONCLUSION**

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Martin R. Geissler, Applicants' Attorney at 1.703.621.7140 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 50-3828 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully Submitted,

  
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